ATTACHMENT L-1: REPRESENTATIVE SAMPLE TASK

SAMPLE TASK FOR NRDA OF GROUNDWATER AT LOS ALAMOS NATIONAL LABORATORY

1.0 Background

1.1 Site Location and background

Los Alamos National Laboratory (LANL) is a Department of Energy (DOE)/National Nuclear Security Administration (NNSA) facility situated on approximately 27,500 acres (approximately 40 square miles) in north-central New Mexico, approximately 60 miles north of Albuquerque and 25 miles northwest of Santa Fe (Figure 1). Scientific research began at LANL in March of 1943 with the inception of Project Y of the Manhattan Project, the U.S. government's effort to develop and test nuclear weapons. In recent decades, operations at LANL have broadened beyond nuclear weapons development to include missions pertaining to "national security, energy resources, environmental quality, and science".

1.2 Natural Resource Damages Assessment (NRDA) Efforts at Los Alamos

Operations conducted at LANL have resulted in the release of hazardous substances to the environment. Under Federal law, Federal, state, and Tribal governments are authorized to act as trustees of natural resources on behalf of the public (e.g., CERCLA, 42 U.S.C. § 9607 (f); see also 43 C.F.R. §11). In this role, it is the responsibility of the trustees to plan and implement actions to restore, replace, or acquire the equivalent of natural resources and resource services injured as a result of the release of hazardous substances to the environment.

To meet its responsibilities, the Los Alamos National Laboratory Trustee Council (LANLTC) is conducting a NRDA. The NRDA process started with the development and release of the Pre-assessment Screen (PAS) for LANL in January, 2010 (LANLTC 2010) which was followed by the LANLTC's development of a Damage Assessment Plan (DAP) that was finalized in February 2014. The Performance Work Statement (PWS, described in Section C of this solicitation) describes the remaining steps in a typical type B assessment that will lead to possible restoration actions needed to restore, rehabilitate, replace, and/or acquire the equivalent of the injured resources. This sample task is intended to allow Offerors to demonstrate their knowledge and experience in the entire NRDA process as applied to a sensitive natural resource known to be impacted by past LANL operations, groundwater.

2.0 Task Description

The LANLTC requires that the Contractor assist the Trustees with conducting a type B natural resource damage assessment for LANL including off-site areas where hazardous substances released from the Laboratory have or may come to be located. The objectives of the assessment are to: (1) identify and quantify natural resource injuries in the assessment area; (2) inform the selection of response actions and restoration alternatives to avoid, mitigate or compensate for actual or potential natural resource injuries; and (3) prepare a report of the assessment and restoration compensation determination plan.

These efforts shall build on work already completed for this site, especially the DAP, and will assist the Trustees in successfully reaching agreement regarding natural resource damage restoration. The Contractor shall work closely with the Trustee agencies to discuss approach and to obtain and review all available, pertinent information for this task. Note Los Alamos is one of the most studied and monitored sites in the world. For example, the *2008 Environmental Surveillance* report for Los Alamos indicates that, for all media and programs at the Laboratory, 1,700 locations, 11,185 samples, and over 700,000 measurements or analytes were evaluated. The contractor shall furnish qualified personnel, equipment, materials, and services, except as otherwise specified in the contract, to perform the scope detailed in this task order.

3.0 Performance Requirements

The resource to evaluate under this sample task order is groundwater. The Contractor is responsible for completing the groundwater assessment major activities and subtasks as discussed in Section 4.2, Groundwater Assessment Task, in support of the LANLTC NRDA objectives.

Performance Period is anticipated to be no longer than 12 months.

Government Furnished Services and Items (GFSI) includes: access to current available site and Pueblo groundwater data; and access to LANL groundwater monitoring wells, if required. Any equipment purchased specifically for the task and charged to the task shall become the property of the government and be managed in accordance with FAR 52.245-1, Government Property.

4.0 Conduct Assessment of Groundwater Resources

4.1 Groundwater Background

Groundwater in the Los Alamos area occurs in three modes: (1) water in shallow alluvium in canyons, (2) intermediate perched water (a body of groundwater above a less permeable layer that is separated from the underlying main body of groundwater by an unsaturated zone), and (3) the regional aquifer, at depths ranging from 600 to 1,200 feet, which is the only aquifer in the area capable of serving as a municipal water supply. Water in the regional aquifer is in artesian conditions under the eastern part of the Pajarito Plateau near the Rio Grande and under phreatic conditions beneath most of the Pajarito Plateau. The source of most recharge to the regional aquifer appears to be infiltration of precipitation that falls on the Jemez Mountains. A secondary source is localized infiltration in canyons on the Pajarito Plateau. The upper portion of the regional aquifer beneath the Laboratory discharges into the Rio Grande through springs in White Rock Canyon. See Figures 2 and 3.

All water produced by the Los Alamos County water supply system comes from the regional aquifer and meets federal and state drinking water standards. No drinking water is supplied from the alluvial and intermediate groundwater.

Substances released from the Laboratory in liquid effluents discharged to canyons have been detected in groundwater, with the highest concentrations recorded in alluvial groundwater. Substances from these Laboratory effluents have also been detected in the intermediate perched zones and the regional aquifer. The contaminated alluvial and intermediate perched

groundwater bodies are separated from the regional aquifer by hundreds of feet of dry volcanic rock, so infiltration from the shallow groundwater occurs slowly.

Since the early 1990s, the Laboratory has significantly reduced both the number of industrial outfalls (from 141 to 12 active) and the volume of water released (by 80%). From 1993 to 1997, total estimated average release was 1,300 million (M) gal./yr. Flow decreased to 230 M gal./yr from 1998 to 2005 and was 141 M gal./yr in 2010. Major upgrades to the TA-50 Radioactive Liquid Waste Facility (RLWTF) in 1999 through 2002, along with continuing major investments to enable continued operations, as well as some new construction such as the zero liquid discharge evaporation tanks, brought effluents into compliance with standards for radionuclides and constituents regulated under NPDES and NM groundwater discharge permits. Alluvial groundwater quality in Mortandad Canyon has improved due to these project improvements.

Where Laboratory contaminants are found in deep groundwater, the setting is either a canyon where alluvial groundwater is usually present (because of natural runoff or Laboratory effluents) or a location where large amounts of liquid effluent have been discharged. During 2010, LANL received and evaluated 153,000 analytical results for groundwater samples from wells and springs. Table 1 summarizes contaminants detected in portions of the groundwater system. The annual environmental surveillance reports for Los Alamos provide additional detail in this regard.

The Laboratory has detected hexavalent chromium in several regional aquifer monitoring wells: at up to 20 times above the NM groundwater standard in Mortandad Canyon and at 50% of the NM groundwater standard in nearby Sandia Canyon. Samples from an intermediate perched zone well in Sandia Canyon contain chromium at 10 times the standard. As may be seen in attached plume map ,the hexavalent chromium is very close to the San Ildefonso property boundary and is thus a highly visible public concern.

Concentrations of chloride below the NM groundwater standards, but above estimated background levels are present in alluvial groundwater in Pueblo, Los Alamos, Sandia, Mortandad, and Pajarito canyons, and in an intermediate perched groundwater zone near the Laboratory's main warehouse. The source is runoff from road salting during the winter months from both Laboratory and non-Laboratory road salting programs.

Nitrate has been measured below NM groundwater standards but above estimated background levels in Sandia Canyon and Mortandad Canyon regional aquifer monitoring wells.

Perchlorate is detected in most groundwater samples analyzed across northern NM. Naturally occurring perchlorate concentrations range from about 0.1 µg/L to 1.8 µg/L. Perchlorate is above the 4 µg/L Consent Order screening level at a regional aquifer Pueblo Canyon well, but below the EPA interim health advisory of 15 µg/L. Perchlorate concentrations in Mortandad intermediate perched groundwater zone wells are above the Consent Order screening level but have been decreasing over the past five years. Perchlorate concentrations are also above the Consent Order screening level in wells in the regional aquifer below Mortandad Canyon, and have increased over the past four years. Following well rehabilitation activities in 2008, Trichloroethene was detected at 1,147 feet in Pajarito Canyon regional aquifer monitoring well

R-20. Trichloroethene detections have continued for five consecutive sample events through the end of 2010. The concentrations have dropped from 60% to less than 20% of the 5 µg/L EPA screening level in 2010. The source has not been determined.

The intermediate groundwater in various locations shows localized elevated levels of tritium, organic chemicals (RDX, chlorinated solvents, dioxane[1,4-]), and inorganic chemicals (hexavalent chromium, barium, boron, perchlorate, fluoride, and nitrate) from Laboratory operations.

The total radionuclide activity from LANL-sourced substances in groundwater exceeded the dose limit that is applicable to drinking water (4 mrem/yr) only in the alluvial groundwater in portions of Mortandad and DP/Los Alamos canyons. This is mainly due to the presence of strontium-90. Because strontium-90 bonds tightly to sediments, the contamination is not moving downward from the alluvial system. The Laboratory monitors springs in White Rock canyon as a principal discharge of regional aquifer groundwater that flows underneath the Laboratory. Naturally occurring levels of uranium, perchlorate, and arsenic are present in some springs. Similar results are found in samples from Pueblo de San Ildefonso wells.

Background values for groundwater analytes at Los Alamos can be found in "Groundwater Background Investigation Report, Update to Revision 4", Los Alamos National Laboratory report LA-UR-11-6228, dated November 3, 2011. This report can be found in the LANL electronic reading room.

Laboratory surveillance monitoring of the Los Alamos County drinking water system and the Santa Fe Buckman well field demonstrate no impact from LANL-sourced substances.

4.2 Groundwater Assessment Task

The major groundwater assessment activities and subtasks included in this task order are:

1. Groundwater Data Review and project planning--review available environmental media data in the Intellus data base and pertinent data under management of Tribal trustees, as necessary

--review pertinent available environmental media data in LANL and other publications

--prepare project specific work plans and quality assurance project plans as necessary to support activities. All draft documentation required by this task order will be reviewed by the LANLTC for acceptability. Assume for costing purposes the minimum review time is 30 days for review and 60 days for approval by the LANLTC.--

2. Quantify injured groundwater in terms of volume and dimensions--perform analysis of groundwater data to aid in determination of injury, quantification of injury, and damage assessment

--identify from Table 1 the critical contaminants of concern for purposes of NRDA groundwater assessment

--define the resource area of concern

3. Determination of baseline services and service losses including tribal service losses due to natural resources injuries--evaluate baseline conditions that would have existed but for the release of the CoCs in the resource area of concern including cultural use study to determine tribal uses of groundwater, if needed.

--If necessary, propose field studies to fill data gaps or validate assumptions. Assume for costing purposes performance of one field study with data collected from existing wells and monitoring stations on LANL, State, and Pueblo property per LANLTC approval of existing data gaps and baseline conditions. Further assume that no wells beyond those established by the extant Environmental Restoration Program will be required

--determine extent and location of injury to groundwater

--quantify service loss resulting from groundwater injury. Offerors should identify preferred approach(s) for valuation of groundwater injury that are relevant and appropriate to site conditions and socioeconomics of affected populations (e.g., market-price methodology, contingent valuation methodology, etc.)

4. Determination and monetization of damages

--prepare a report of assessment and restoration compensation determination plan for LANLTC consideration

4.3 Other Administrative Support

Other ancillary administrative tasks to support the Trustee Council are as follows:

1. The Contractor will provide administrative support to Trustee Council such as drafting and circulating notes of Trustee Council meetings for Trustee Council review and approval, coordinating meeting agendas, and other administrative tasks as assigned.

2. The Contractor shall maintain the LANL NRD website

3. The Contractor shall maintain the LANL NRD Administrative Record

5.0 Assumptions for Sample Task Order

The Groundwater Assessment Task Order includes subtasks as outlined in Section 4.2 above. In some instances, direction is given as to the assumptions to be used for cost estimation purposes. In those cases, the contractor should also provide unit costs in the event that actual scope exceeds the cost-basis assumptions. Each sub-task should be costed separately regardless of whether a task is optional or required. For optional tasks if there are costs or implementation implications associated with the need to support iterative decision-making, these should be clearly identified and described. The following general assumptions also apply and should be factored into the cost estimate for the sample task. All draft documentation required by this task order will be reviewed by the LANLTC for acceptability.

- Assume for costing purposes the minimum review time is 30 days for review and 60 days for approval by the LANLTC.
- Attendance at established monthly LANLTC meetings in Santa Fe for duration of task order period of performance and potentially two individual, separate meetings with each LANLTC member to discuss specific issues and concerns. Assume for costing purposes the meeting times are 9:00 am to 5:00 pm on normal workdays.
- Regulatory definitions of what constitutes injury to categories of natural resources are provided in Appendix C of the LANL Damage Assessment Plan.
- Access to government resources and equipment for groundwater monitoring will be coordinated with the M&O contractor to correspond with routine sampling events.
- Assume for costing purposes performing one field study with data collected from existing wells and monitoring stations on LANL, State, and Pueblo property per LANLTC approval of existing data gaps and baseline conditions.
- Assume for costing purposes that no additional wells beyond those already established by the remediation efforts will be required.

6.0 Deliverables

#	Deliverable/Milestone Description	Contract Reference	Due Date	Information or LANLTC Review/Approval Required
1	Attend Site Orientation and Tour	PWS C.3.2.3	Schedule within 2 weeks of award	Information
2	Conduct meetings with Trustee Council and individual Trustee members as necessary	PWS C.3.2.10	Schedule for next TC meeting; prepare a schedule of meetings with individuals within 1 week of award	Information
3	Discuss Approach with Trustee Council	Sample Task Section 2.0	Schedule for next TC meeting in conjunction with item 4	Information
4	Prepare Groundwater Assessment Project Management Plan and revise as necessary	PWS C.3.2.1	Due within 4 weeks of of initial meetings w/ TC and/or site tours	LANLTC Approval
5	Submit Groundwater Quality Assurance Project Plan in accordance with QMP (Appendix 1 of DAP)	PWS C.3.2.1	Due within 6 weeks of award	LANLTC Approval

6	Complete Review of existing data and present recommendations of data gaps to Trustee Council	Sample Task Section 4.2.1	Due within 8 weeks of award; schedule presentation with Trustee council at next available meeting	Information
7	Complete Evaluation of Baseline Conditions and background values for GW	Sample Task Section 4.2.3	Due within 12 weeks of award	Information
8	Complete Analysis of any necessary studies to fill data gaps	Sample Task Section 4.2.3	Present to Trustee Council within 13 weeks of award	Information
9	Complete Evaluation of Injury to Groundwater	Sample Task Section 4.2.3	Within 16 weeks of award. Present to Trustee Council at next available meeting.	Information
10	Develop Service Loss Quantification and valuation methodology and present to Trustee Council	Sample Task Section 4.2.3	Within 17 weeks of award. Present to Trustee Council at next available meeting.*	Information and LANLTC Approval
#	**Deliverable/Milestone Description**	**Contract Reference**	**Due Date**	**Information or LANLTC Review/Approval Required**
11	Complete draft report of assessment	Sample Task Section 4.2.4	Due within 20 weeks of award*	LANLTC Approval
12	Prepare draft restoration compensation determination plan	Sample Task Section 4.2.4	Due within 20 weeks of award*	LANLTC Approval

Sample Task Tables and Figures

Table 1: LANL Impacts on Groundwater that Result in Values Near or Above Regulatory Standards, Screening Levels, or Risk Levels

Chemical On-Site Off-Site Significance Trends

Chemical	On-Site	Off-Site	Significance	Trends
Chromium	Regional aquifer in Mortandad Canyon, intermediate groundwater in Mortandad and Sandia Canyons	No	Found in regional aquifer above groundwater standards; not affecting drinking water supply wells; source eliminated in 1972.	Increasing in Mortandad intermediate groundwater. Fairly steady over five years at other locations in Mortandad and Sandia canyons' intermediate and regional groundwater
Nitrate	Intermediate groundwater in Pueblo and Mortandad canyons, and regional groundwater in Sandia Canyon and Mortandad Canyon	Pueblo and Los Alamos Canyons	In Pueblo Canyon, may be due to Los Alamos County's Sewage Treatment Plant; otherwise due to past effluent discharges. TA-50 RLWTF effluents have met discharge limits since 2000.	Generally variable in Pueblo, steady in Sandia, decreasing in Mortandad Canyon
Perchlorate	Alluvial, intermediate, and regional groundwater in Mortandad Canyon; intermediate in Los Alamos Canyon; regional aquifer in Pueblo Canyon	Pueblo Canyon	Reflects past outfall discharges that have ceased	Decreasing in Mortandad Canyon alluvial groundwater due to effluent quality improvement; increasing at one location in the regional aquifer in Mortandad Canyon
Dioxane[1,4-]	Intermediate groundwater in Los Alamos, Mortandad, and Pajarito Canyons	No	Not used as drinking water supply; limited in extent	Fairly steady or decreasing concentrations over five years in Los Alamos and Mortandad; seasonal variation in Pajarito
Trichloroethane [1,1,1-]; dichloroethene[1,1-]	Intermediate groundwater near main warehouse	No	Not used as drinking water supply; limited in extent	Seasonally variable, undergoing corrective action
RDX	Alluvial and intermediate groundwater in Cañon de Valle, intermediate groundwater in Pajarito Canyon	No	Not used as drinking water supply; limited in extent	Generally stable, seasonal fluctuations. In the regional aquifer in Pajarito Canyon, values are below standards, but increasing at one location.
Barium	Alluvial groundwater in Cañon de Valle and Pajarito and Mortandad Canyons	No	Not used as drinking water supply; limited in extent	Generally stable in Cañon de Valle, in others likely due to cation-exchange caused by road salt
Boron	Intermediate groundwater in Cañon de Valle	No	Not used as drinking water supply; limited in extent	Generally stable, seasonal fluctuations

Chemical	On-Site	Off-Site	Significance	Trends
Tetrachloroethene, trichloroethene	Alluvial and intermediate groundwater in Cañon de Valle	No	Not used as drinking water supply; limited in extent	Generally stable, seasonal fluctuations
Strontium-90	Alluvial groundwater in Los Alamos and Mortandad canyons	No	Not used as a drinking water supply; has not penetrated to deeper groundwater. TA-50 RLWTF effluent discharges decreased since 2000.	Mainly fixed in location; some decrease due to effluent quality improvement
Fluoride	Alluvial groundwater in Los Alamos and Mortandad canyons. Intermediate groundwater in Pueblo and Los Alamos canyons. Regional aquifer in Pueblo Canyon	Pueblo Canyon	Result of past effluent releases; not affecting drinking water supply wells	In alluvium, slow decrease in concentration due to effluent quality
dissolved solids	Alluvial groundwater in Pueblo, Los Alamos, Sandia, Mortandad, Pajarito canyons, intermediate groundwater near TA-3 main warehouse	Pueblo Canyon	Due to road salt in snowmelt runoff	Values generally highest in winter or spring samples
Fluoride, uranium, nitrate, total dissolved solids	No	Pine Rock Spring, Pueblo de San Ildefonso	Water quality apparently affected by irrigation with sanitary effluent at Overlook Park	Steady over several years

Figure 1: Site Location

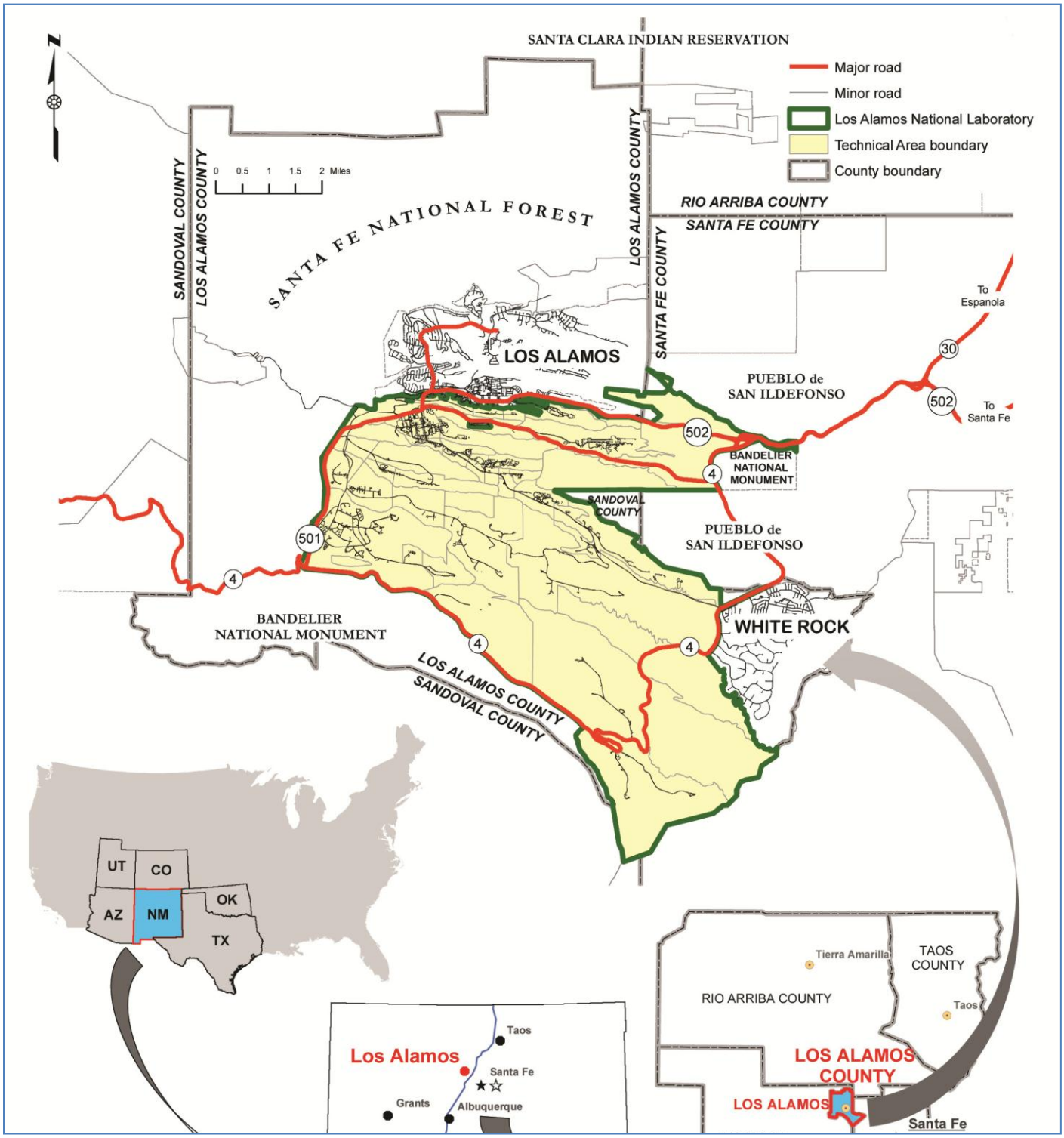

Figure 2: General Geologic Cross Section of Site

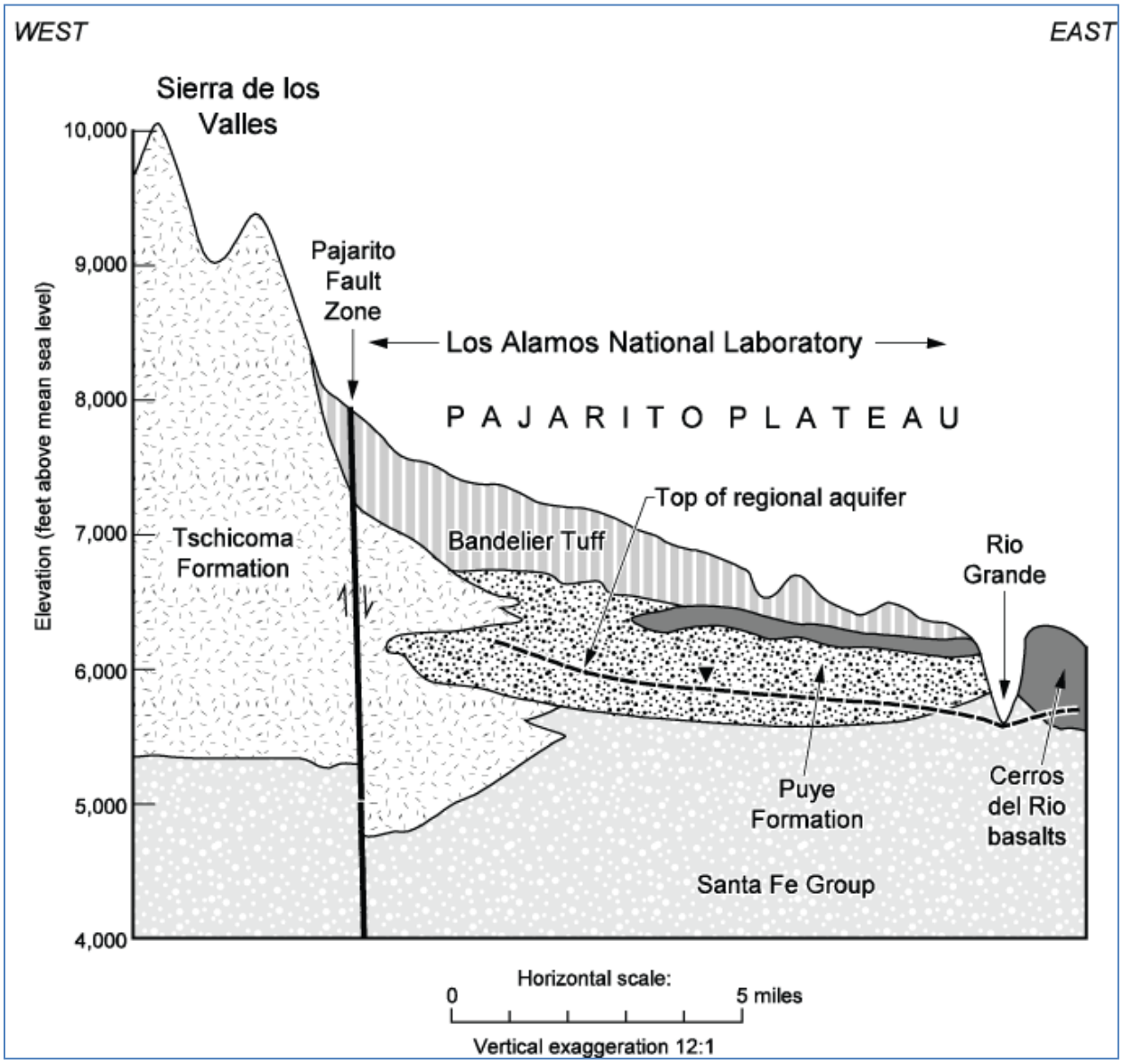

Figure 3: Three Modes of Groundwater occurrence at the Site

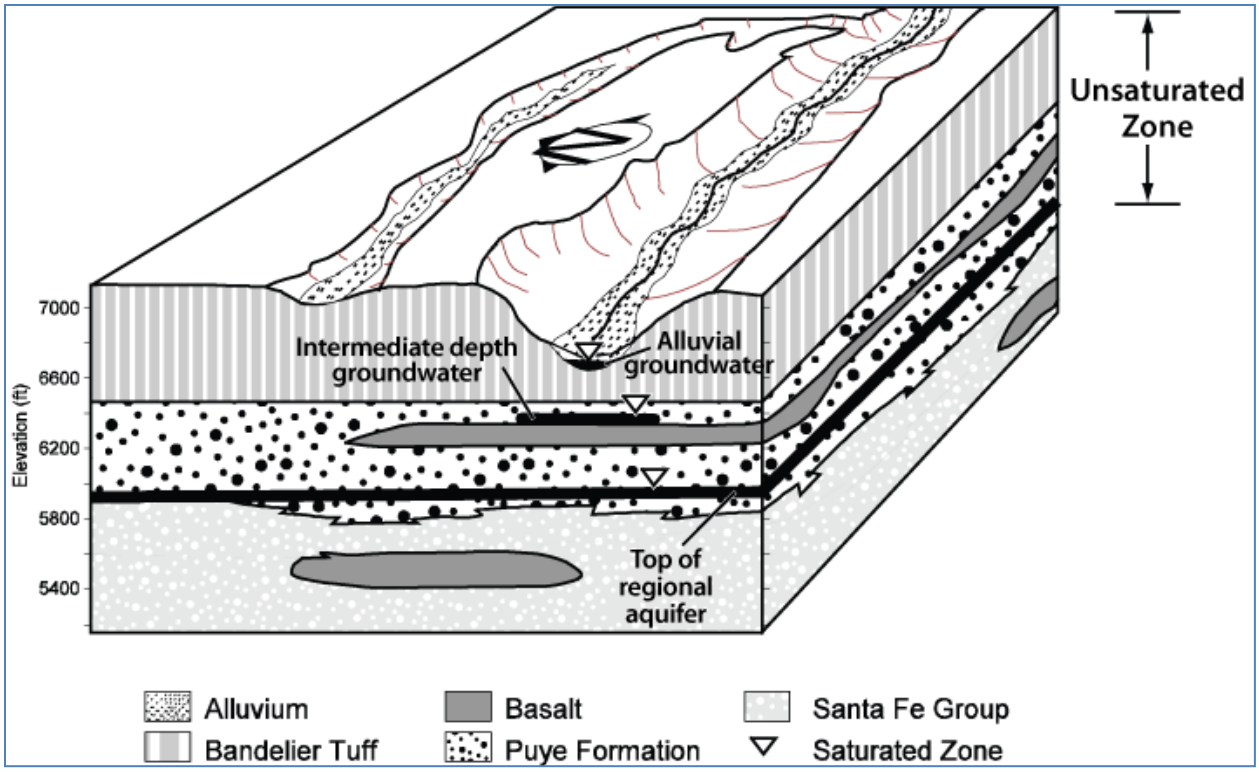

Figure 4: Locations of surrounding pueblos and Topography of region

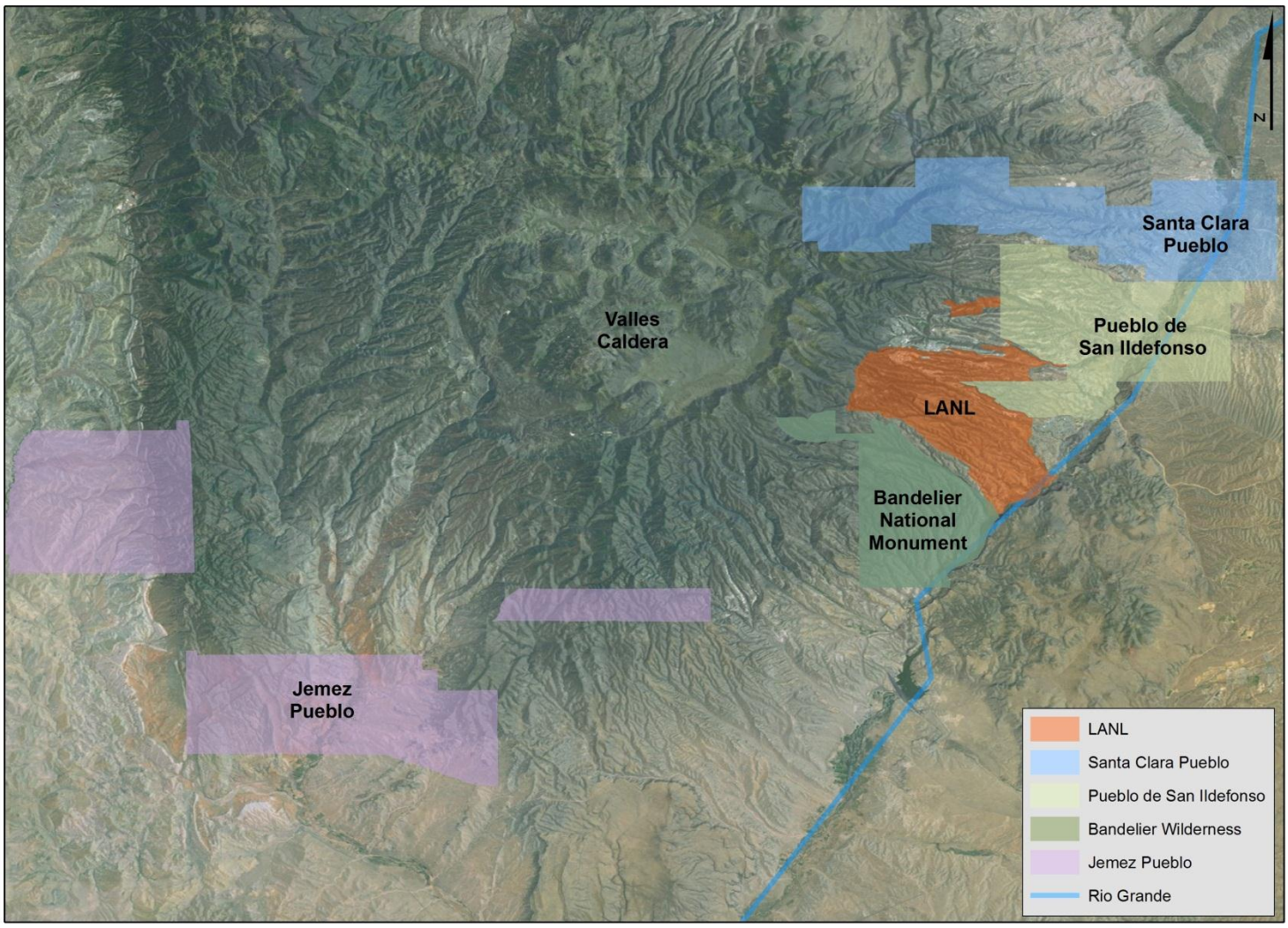

Figure 5: Map of burn area surrounding Los Alamos

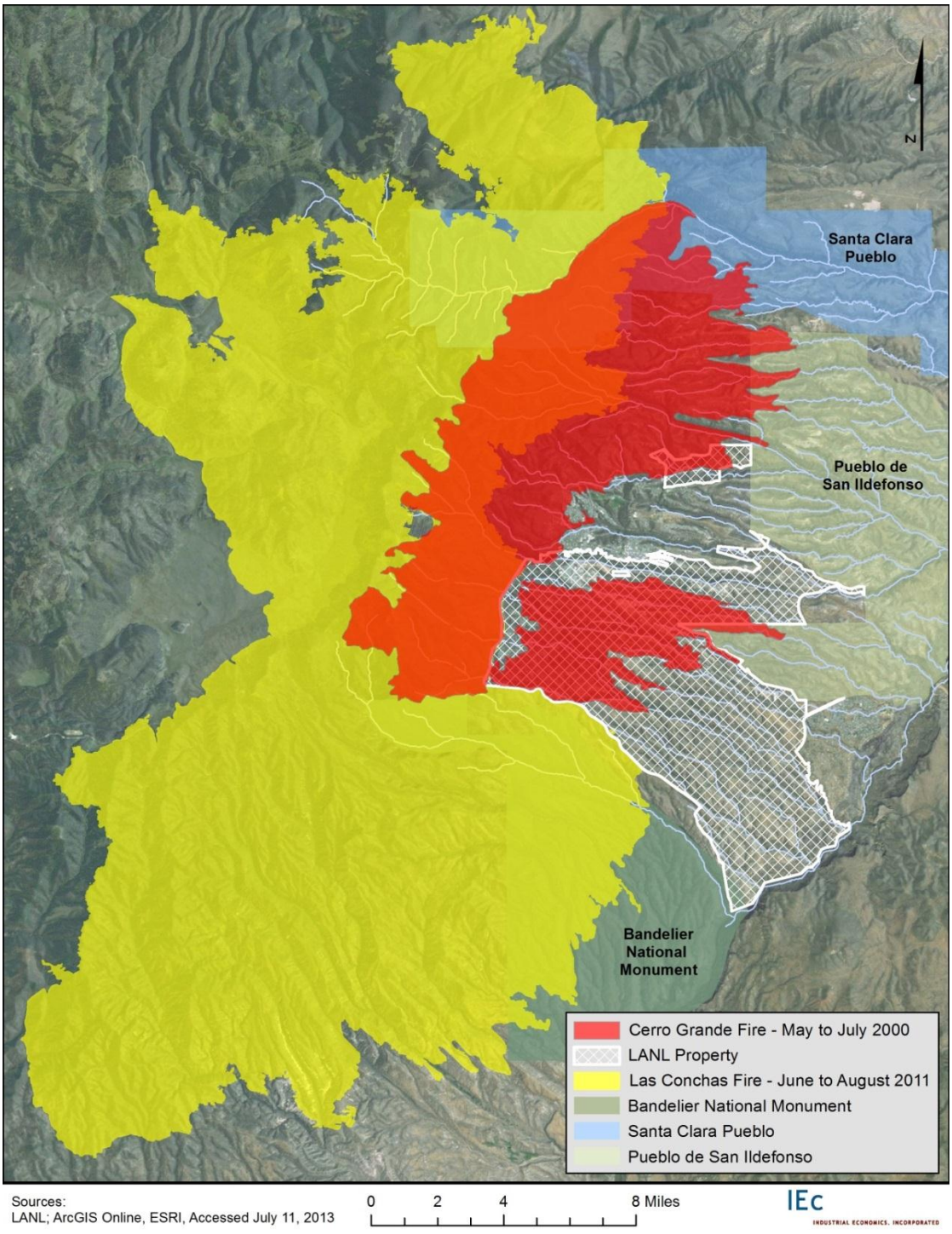

Figure 6: Map of Production Wells near Los Alamos